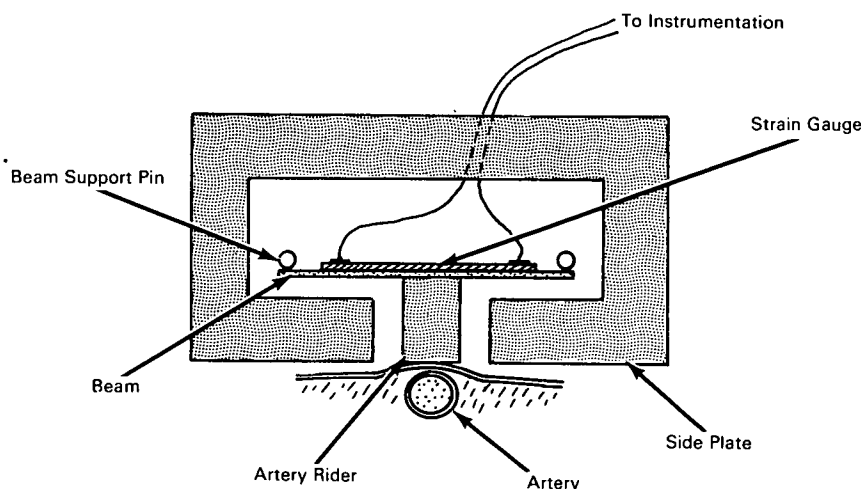


# NASA TECH BRIEF



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## Direct Force-Measuring Transducer Used in Blood Pressure Research



**The problem:** In the past, methods of measuring blood pressure in humans have been less than ideal for several reasons. The direct pressure reading method using an arterial catheter is the most dependable but causes considerable discomfort to the patient and requires a high degree of immobility. The widely used cuff method used in conjunction with a stethoscope requires practically complete immobility of the patient, places a premium on the operator's aural acuity, and is not useful in the presence of ambient noise.

**The solution:** A direct force-measuring transducer that acts as an arterial tonometer, gives a direct read-out to instrumentation, and is unaffected by ambient noise.

**How it's done:** The transducer consists of a metal housing that is open at the bottom, an internal beam

mounted on two support pins, on which a semi-conductor strain gauge is mounted, and from which an arterial rider is suspended into the bottom opening of the housing. Electrical leads from the strain gauge are connected externally to a constant voltage source and appropriate instrumentation.

In operation, the transducer is placed over the radial or temporal artery and positioned so that the housing side plates rest on either side of the artery and the rider is centered over the artery. The device is then pressed down firmly until a further increase in loading pressure causes no increase in amplitude of the pressure pulses being detected. This plateau of pressure signal during increasing loading pressure determines final correct positioning. Pressure pulses in the artery act on the rider which transmits the energy to the beam, causing deflection in the beam.

(continued overleaf)

and its attached strain gauge. Deflection of the strain gauge changes its resistance and alters the voltage reading on the associated instrumentation.

**Note:** Calibration of the deflection signal from the strain gauge is made by placing the transducer over an elastic tube whose pressure is measured by a direct manometer.

**Patent status:** Title to this invention has been waived under the provisions of the National Aeronautics and Space Act (42 U.S.C. 2457(f)), to Stanford Research Institute, Menlo Park, California.

Source: Gerald L. Pressman, Peter M. Newgard,  
and John J. Eige of  
Stanford Research Institute  
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